New patent claim 1

1. A roof structure for a vehicle with a roof panel (1), with side wall panels (2) and with a front and rear roof frame (10, 11), the roof panel (1) having a front side (3) and a rear side (4) and a longitudinal side (5, 6) on both sides, and the front roof frame (10) being assigned to the front side (3) of the roof panel (1) and the rear roof frame (11) being assigned to the rear side (4), and the roof panel (1) being connected at least indirectly at its longitudinal sides (5, 6) to the side wall panels (2), the roof panel (1) being connected to the side wall panels (2) and/or to the front roof frame (10) and/or to the rear roof frame (11) via one or more angled bars (20, 20', 23, 23'), an essentially vertical limb (21) of the angled bar (20, 20') projecting upward to the roof panel (1) and an essentially horizontal limb (22) of the angled bar (20, 20') projecting away from the side wall panel (2), and furthermore, the roof panel (1) being angled downward at its longitudinal sides (5, 6) with an edge strip (7) and being connected to the vertical limb (21) of the angled bar (20), and the horizontal limb (22) of the angled bar (20) being connected to a flange (8) of the side wall panel (2), characterized in that the edge strip (7) is angled away from the roof panel (1) by at least 90°, so that the edge strip (7) projects under the roof panel (1).

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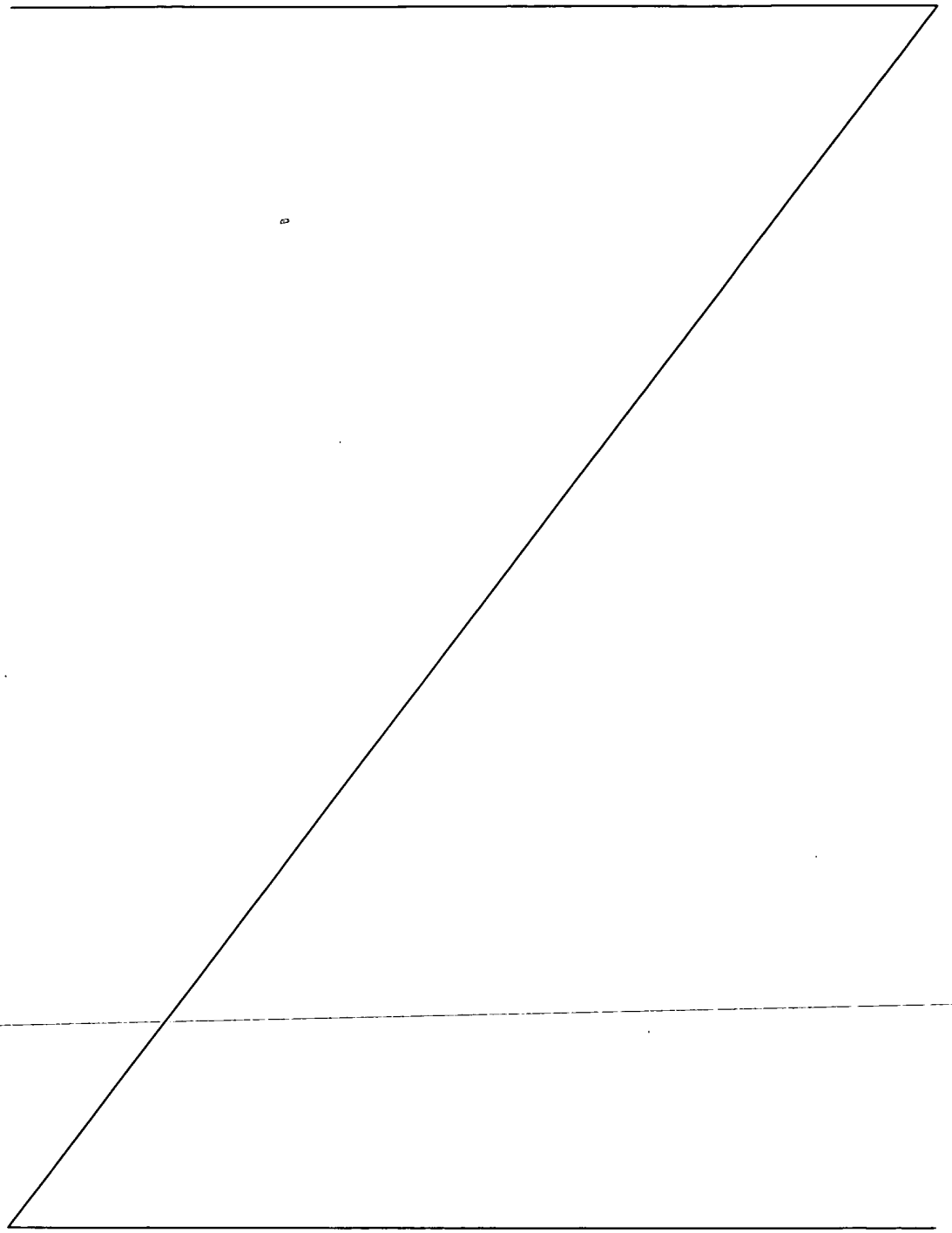

US 5 968 298 A discloses a roof structure for a vehicle with a roof panel, with side wall panels and with a front and rear roof frame, the roof panel having a front side and a rear side and a longitudinal side on

both sides, and the front roof frame being assigned to the front side of the roof panel and the rear roof frame being assigned to the rear side, and the roof panel being connected at least indirectly at its longitudinal sides to the side wall panels, the roof panel being connected to the side wall panels and/or to the front roof frame and/or to the rear roof frame via one or more angled bars.

FR-A-2 818 228, which forms the generic type, discloses a roof structure for a vehicle with a roof panel, with side wall panels and with a front and rear roof frame, the roof panel having a front side and a rear side and a longitudinal side on both sides, and the front roof frame being assigned to the front side of the roof panel and the rear roof frame being assigned to the rear side, and the roof panel being connected at least indirectly at its longitudinal sides to the side wall panels, the roof panel being connected to the side wall panels and/or to the front roof frame and/or to the rear roof frame via one or more angled bars, an essentially vertical limb of the angled bar projecting upward to the roof panel, and an essentially horizontal limb of the angled bar projecting away from the side wall panel, and the roof panel furthermore being angled downward at its longitudinal sides with an edge strip and being connected to the vertical limb of the angled bar, and the horizontal limb of the angled bar being connected to a flange of the side wall panel.

It is the object of the invention to specify a roof structure and a method for producing said structure, in which a roof duct which is as narrow as possible can be achieved.

The object is achieved according to the invention by

the features of the independent claims.

According to the invention, a roof panel is connected to a side wall panel and/or to a front roof panel and/or to the rear roof panel via an angled bar. Furthermore, an essentially vertical limb of the angled bar projects upward to the roof panel and an essentially horizontal limb of the angled bar projects away from the side wall panel. The angled bar is concealed by the roof panel. Furthermore, the roof panel is angled downward at its longitudinal sides with an edge strip and is connected to the vertical limb of the angled bar, and the horizontal limb of the angled bar is connected to a flange of the side wall panel. The roof panel and angled bar can be joined together from the inside and a joining region does not need to be accessible from the outside. A roof duct between the side wall panel and roof panel can therefore be designed freely and minimized.

According to the invention, the edge strip is angled away from the roof panel by at least 90° and therefore projects under the roof panel. It is therefore ensured that the roof panel protrudes over the angled bar. The edge strip, and therefore a joining region between the roof panel and angled bar, is covered by the roof panel. One advantage is that the angled bar, unlike a roof inner part, does not constitute a reinforcement of the roof panel, but merely constitutes a structural element which is inserted during the joining of the roof structure. A roof duct of the roof structure can therefore be designed virtually as desired, in particular with regard to width and filling or covering, and can be designed, in particular, as an indistinct joint. The design of a conventional roof duct is shaped essentially by the dimensions of the

individual parts and the necessity of accessibility during assembly for the processes used for joining the roof structure. Similarly, the invention provides the possibility of realizing, in a simple manner, a roof structure in a light-weight construction or sandwich-type construction, in particular with different materials. The roof panel can be brought right up to the side wall panel.

In a preferred development of the invention, the front side and/or the rear side of the roof panel is of stepped design at its end and ends in a lowered flange, the lowered flange being provided for receiving a window. This arrangement is suitable particularly for a roof panel made from steel.

In a further preferred refinement of the invention, an angled bar is arranged on the front side and/or rear side of the roof panel, the essentially horizontal limb of which projects away from the roof panel and is provided for receiving a window. The front side and/or rear side of the roof panel is preferably angled by at most 90°. The respective essentially vertical limb engages behind the angled end of the front side and/or rear side of the roof panel. This arrangement is suitable particularly for a roof panel in a light-weight construction, in particular a roof panel made from aluminum or an aluminum alloy.